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ABSTRACT

A study was conducted to examine the influence of topic familiarity on good and poor readers' ability to identify and use important information in expository texts. Subjects were 56 eighth grade students and 37 adults. After indicating their familiarity with the topics of eight experimental passages using J. P. Guilford's method of paired comparisons, subjects read, summarized, and rated the importance of each passage. The resulting data were used to compute four dependent measures, each of which assessed a different dimension of students' sensitivity to importance: (1) agreement with adult ratings of importance, (2) agreement with peer ratings of importance, (3) agreement with adult summaries, and (4) agreement with peer summaries. The analyses revealed that good readers were significantly more in agreement with adults' ratings of importance and adult summaries than were poor readers. Good and poor readers did not differ in terms of peer group consistency of importance ratings or in the summaries. The analyses also revealed that both good and poor readers became more sensitive to importance when they were dealing with more familiar passages than when they were dealing with less familiar ones. Adults' agreement over which elements to consider as important increased with topic familiarity as well. The findings support earlier studies indicating that the degree of topic specific knowledge has a powerful effect on reading comprehension. (HTH)

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CENTER FOR THE STUDY OF READING

Technical Report No. 337

THE EFFECTS OF TOPIC FAMILIARITY ON GOOD AND POOR READERS' SENSITIVITY TO WHAT IS IMPORTANT IN TEXT

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June 1985

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Abstract

This study examined the influence that topic familiarity had on good and poor readers' ability to identify and use important information in expository texts. Fifty-six eighth-grade students and thirty-seven adults indicated their relative familiarity with the topics of eight experimental passages using Guilford's (1954) method of paired comparisons. Subjects then read, summarized, and rated the importance of the information in each passage. Several measures of sensitivity to importance were derived from the children's summaries and importance ratings: (a) agreement with adult ratings; (b) agreement with peer ratings; (c) agreement with adult summaries; and (d) agreement with peer summaries. When the data were subjected to a 2 (Reading Achievement) x 2 (Topic Familiarity) repeated measures multivariate analysis of variance using the four measures of sensitivity to importance as dependent variables, significant effects were revealed for Reading Achievement ($p < .05$) and Topic Familiarity ($p < .05$). These results corroborate and extend earlier research dealing with sensitivity to importance.

The Effects of Topic Familiarity on Good and Poor Readers' Sensitivity To What is Important in Text

Good readers are able to comprehend text not because they try to recall every detail of information but because they avoid doing so. They are selective in what they comprehend. Thus, a great deal of research has been aimed at understanding how readers identify and comprehend the important information in texts (e.g., Baker & Stein, 1981; Winograd & Bridge, in press). These research efforts are motivated by a number of reasons. Theoretically, the ability to identify important elements in a text is essential to the ability to organize the meaning of a text which, in turn, is an essential aspect of comprehension (Anderson, 1984). Pedagogically, the ability to identify the important elements in a text is essential for learning most of the content area information that students are to learn from text (Herber, 1978; Nicholson, 1984).

Although the motives for this research have been rather straightforward, the results have indicated that sensitivity to importance is indeed a complex phenomenon. Among the factors that have proven relevant to sensitivity to importance are: (a) the readers' background knowledge of both content and text structure (e.g., Anderson, Reynolds, Schallert, & Goetz, 1977; Meyer, in press); (b) the text's

structure (e.g., Meyer, 1975; Stein & Glenn, 1979); (c) the readers' ability level (e.g., Smiley, Oakley, Worthen, Campione, & Brown, 1977; Taylor, 1979; Winograd, 1984); and (d) the readers' purpose for reading (e.g., Pichert & Anderson, 1977). We have come to understand that what is considered important in a text and the ability to identify and use that information may vary from "narrative to expository text, from reader to reader for the same text, and within the same reader for the same text depending upon purpose and context" (Winograd & Bridge, in press, p. 40).

Our purpose in this study is to examine the effects of background knowledge and reading ability on eighth-grade students' sensitivity to what is important in expository texts. For this study, we defined background knowledge, reading ability, and sensitivity to importance in the following manner: Background knowledge was measured by obtaining ratings of each subjects' perceived familiarity with the topic of each experimental text. Reading ability was measured by level of achievement on a standardized test of reading comprehension. Sensitivity to importance was measured in a number of ways: (a) agreement with adult ratings of importance; (b) agreement with peer ratings of importance; (c) agreement with adult summaries; and (d) agreement with peer summaries.

Our reason for obtaining multiple measures of sensitivity to importance is based on recent research that

distinguishes among several dimensions of the construct. First, several studies (McConaughy, 1980; Pichert, 1979; Winograd, 1984) indicate that younger and poorer readers differ from older and better readers in what is considered important in texts. Second, some studies (Brown & Smiley, 1977, 1978; Winograd, 1984) indicate that sensitivity to importance varies across tasks. For example, children tend to recall more important information than unimportant information but have trouble explicitly identifying important information or using important information in the completion of other tasks like studying or summarizing. It was our thinking that by examining several dimensions of sensitivity to importance we would have a broader understanding of the effects of topic familiarity and reading ability.

Method

Subjects

The subjects in this study were fifty-six eighth-grade students and thirty-seven adults. Poor readers (n = 29) scored below the 50th percentile on the Reading Comprehension Subtest of the Stanford Achievement Test; good readers (n = 27) scored above the 59th percentile on the same test. The adults were undergraduate students, graduate students, or recent graduates at the doctoral level at a major midwestern university.

Materials

Eight expository passages adapted from trade books and elementary social studies, science, and reading texts were used in this study. The eight passage titles reflected the eight topics: Cities in the 1800's, Life in Nigeria, Otters, Schools in Colonial America, Killdeer, Salmon, Desert Plants and Animals, and The Mohave Indians. All of the passages were approximately equal in word length (m = 344, sd = 18.35) and they ranged from the upper third grade to the lower sixth grade according to the Fry (1977) readability formula.

In addition to the eight expository passages, a questionnaire was developed in order to assess each subject's relative familiarity with the topic of each of the eight passages. The format of the questionnaire was based on Guilford's (1954) method of paired comparisons. Each of the eight passage titles was paired with every other passage title resulting in twenty-eight possible comparisons. For each comparison the subject was directed to, "Please circle which topic you think you know more about." For example, the first comparison read:

I think I know more about:

Desert Plants and Animals or The Mohave Indians.

Each subject's responses to these twenty-eight comparisons produced, for that subject, a series of scaled

scores that were used to rank the passage topics from the most to the least familiar. The data to be reported in this study are derived from the summaries and importance ratings based on two passages per subject: one passage rated as most familiar and one passage rated as least familiar. It should be noted that different subjects rated different passages differently, that is, a passage that was rated as most familiar by one subject might be rated as least familiar by another subject.

Procedure

The data on the eighth-grade students were collected as part of a larger study (Winograd, 1984) which was conducted in two stages over a three week period. Each child was involved in approximately eight forty-minute sessions. During the first stage, the students completed the paired comparisons questionnaire. This task was completed before the students encountered any of the passages. During the second stage, the eighth-grade students: (a) read each passage; (b) wrote a sixty-word summary of the passage (the passage was available during this task); and (c) rated the importance of each sentence to the passage as a whole. After the last step, the children were given a few minutes to relax before proceeding to the next passage and repeating the process. Each child worked with a total of six of the eight passages and equal numbers of subjects read each of the eight passages. In addition, the summarization and the

importance rating tasks were counterbalanced so that the children summarized and then rated the importance for the first three passages and then reversed the order for the last three passages.

The data on the adults were collected in a single two-hour session. Each adult first completed the paired comparison questionnaire and then worked with all eight passages.

Results

The data from the subjects' summaries and importance ratings were used to compute four dependent measures, each of which assessed a different dimension of sensitivity to importance. The four dependent measures were:

1. Agreement with adult ratings of importance. This dependent variable was designed to measure the children's ability to identify (through a rating task) which elements in a text are important when importance is defined in adult terms. It was obtained by computing a Pearson correlation coefficient between each child's ratings of importance and the mean adult ratings of importance.
2. Agreement with peer ratings of importance. The second dependent variable was designed to measure the children's ability to identify (through a rating task) which elements is a text are important when importance is defined by peers (other poor readers,

other good readers, or other adults). It was obtained by computing a Pearson correlation coefficient between the individual's ratings of importance and the mean importance rating of his or her peer group (excluding that particular individual).

3. Agreement with adult summaries. The third dependent variable was designed to measure the individual's ability to tacitly use sensitivity to importance as part of a more complex task (constructing a summary) when sensitivity was defined by adults. It was obtained by computing the point-biserial correlation between the elements that an individual included in his or her summary and the number of adults who also included those elements in their summaries.
4. Agreement with peer summaries. The fourth dependent variable was designed to measure the individual's ability to tacitly use sensitivity to importance as part of a more complex task (constructing a summary) when sensitivity was defined by peers. It was obtained by computing the point-biserial correlation between the elements that an individual included in his or her summary and the number of his or her peers who also included those elements in their summaries.

Since the dependent variables are correlation coefficients, Fisher Z transformed coefficients were used in

all appropriate analyses. However, untransformed correlation coefficients are reported to ease discussion.

The experimental design was a 2 (Reading Achievement) X 2 (Topic Familiarity) repeated measures multivariate analyses of variance (MANOVA) using the four measures of sensitivity to importance as the dependent variables. Reading Achievement was the between-subject factor; Topic Familiarity was the within-subject factor.

The data were analyzed using a multivariate procedure rather than univariate analyses because the four dependent variables were assumed to measure somewhat different aspects of a single construct and thus to be moderately correlated. An examination of the data presented in Table 1 supports this assumption. The coefficients for the low topic familiarity passage are presented above the diagonal; those for the high familiarity topic passage are presented below the diagonal.

Insert Table 1 about here

Note that the range in the strength of the relationships varies among the four dependent measures. The four measures - agreement with adult ratings, agreement with peer ratings, agreement with adult summaries, agreement with peer summaries - do seem to be reflecting sometimes related,

sometimes independent dimensions of sensitivity to importance.

Note also that the strength of the relationships among the four dependent variables is generally higher for the good readers than it is for the poor readers. Moreover, the strength of the relationship is generally higher for high topic familiarity than for low topic familiarity within each reading achievement group. Note specifically that the level of agreement between what poor readers and adults rated as important increased from .36 for low topic familiarity to .66 for high topic familiarity. The comparable coefficients for the level of agreement between the good readers and the adults ratings of importance are also lower for low topic familiarity (.75) than for high topic familiarity (.86), but the difference is not as great as that evidenced by the poor readers.

The effects of high topic familiarity are also evident when one considers the coefficients computed between the variables based on peer summaries and adult summaries. For the poor readers, the level of agreement was .37 and .55 for the low and high topic familiarity passages, respectively. For the good readers, the level of agreement was .63 and .78 for the low and high topic familiarity passages, respectively.

The data presented in Table 1 suggest that differences in the level of reading achievement and in the level of

topic familiarity have a strong effect on the relationships among the dependent variables. The significant relationships also reinforce the need for multivariate analyses procedures.

As the next step in the analyses, a repeated measures multivariate analysis of variance was performed. The results from this analysis are presented in Table 2 and the cell means and standard deviations are presented in Table 3.

Insert Tables 2 and 3 about here

Significant main effects were found for Reading Achievement, $F(4,51) = 3.72$, $p < .05$; and for Topic Familiarity, $F(4,51) = 2.69$, $p < .05$. The interaction between Reading Achievement and Topic Familiarity failed to reach significance.

An examination of Table 3 provides some insights into the significant results revealed by the multivariate analyses of variance. Consider first the significant effects of Reading Achievement. Good readers, as expected, show significantly higher levels of agreement with adults' ratings of importance and adults' summaries than do poor readers, regardless of level of topic familiarity. For example, the mean scores representing the level of agreement between good readers' importance ratings and adults's importance ratings is .22 for low topic familiarity and .41

for high topic familiarity. The comparable scores for the poor readers and the adults are .12 for low topic familiarity and .21 for high topic familiarity.

Good readers, in general, are also somewhat higher in level of agreement with each other as to what is important, but they do not appear to be significantly more consistent than do the poor readers. In fact, poor readers's summaries in the low topic familiarity condition are a bit more in agreement (.39) than are the good readers's summaries in the low topic familiarity condition (.35).

Consider next the significant effects of Topic Familiarity. For all four dependent variables, for both good and poor readers, sensitivity to importance was higher when the topic of the passage was more familiar than when the topic of the passage was less familiar. Note also that the adult data revealed the powerful effects of high topic familiarity. For two of the measures - agreement with adult ratings of importance and agreement with peer ratings of importance - the differences between high topic familiarity and low topic familiarity were significant.

The results of the multivariate analyses of variance indicated that the Reading Achievement by Topic Familiarity interaction was not significant. In general, the cell means reveal that both good and poor readers benefited from high topic familiarity. However, one measure - agreement with peer ratings of importance - did display a trend towards a

significant ($p = .06$) interaction. This is interesting because the adult data also show a strong increase in consistency (as measured by agreement with peers) and the poor readers do not.

Discussion

Recall that the purpose of this study was to examine the effects of reading achievement and topic familiarity on eighth-grade students' sensitivity to what is important in expository texts. Four different measures of sensitivity to importance were obtained for each student: (a) agreement with adult ratings of importance; (b) agreement with peer ratings of importance; (c) agreement with adult summaries; and (d) agreement with peer summaries.

The analyses revealed that good readers were significantly more in agreement with adults' ratings of importance and adult summaries than were poor readers. Good and poor readers did not differ, however, in terms of peer group consistency of importance ratings or in the summaries. These results stress the importance of carefully considering how sensitivity to importance is measured.

The more interesting results are those associated with the factor of Topic Familiarity. The analyses revealed that both good and poor readers became more sensitive to importance (especially as measured by agreement with adult and peer rating of importance) when they were dealing with more familiar passages than when they were dealing with less

familiar passages. The data also revealed that adults' agreement over which elements to consider as important increased with the level of topic familiarity. The finding that high topic familiarity enhanced sensitivity to importance augments earlier findings (Birkmire, 1982; Johnston, 1984; Langer, 1982, 1984) that the degree of topic specific knowledge has a powerful effect on reading comprehension.

Why does topic familiarity increase sensitivity to importance? It may be that when readers have well organized background knowledge about a topic, they have a set of expectations, a schema, for integrating their knowledge with new information (Rumelhart & Ortony, 1977). These expectations enable them to sort through trivial information to more important underlying principles. The facilitative effects of high topic familiarity were evident for the good, poor, and adult readers. Although the negative effects (in the sense that the correlation coefficients displayed in Table 3 were lower) of low topic familiarity were evident for all three groups of readers, poor readers seemed particularly vulnerable. It may be that the good readers and adults were able to rely on other means, perhaps a better awareness of the text's structure (Meyer, Brandt, & Bluth, 1980), to help them distinguish the important information from the less important information.

The data reported in this study may also have pedagogical implications. In particular, the results indicated that eighth-grade students' sensitivity to adult conceptions of importance was significantly greater for more familiar passages than for less familiar passages. These results lend further support to the current conviction that one of the teacher's most crucial functions is to develop and activate their students' background knowledge (e.g., Hansen & Pearson, 1983; Langer, 1984). The facilitative effects of high topic familiarity on poor readers' sensitivity to adult conceptions of importance may also indicate that teachers should use highly familiar passages as a starting point for remediation. It would be interesting to see if the significant gains obtained by direct instruction in identifying and using important information (Adams, Carnine, & Gersten, 1982; Baumann, 1984; Brown & Day, 1983; Hare & Borchardt, 1984) could be increased by coupling those direct instruction procedures with a systematic progression from highly familiar texts to less familiar texts.

The procedures reported in this study may also be of interest to other researchers in the area of comprehension research. In particular, we are referring to the method used to assess the relative levels of topic familiarity and to the use of multiple measures of sensitivity to importance.

First, Guilford's (1954) method of paired comparisons proved to be an effective, efficient way for assessing the subject's relative familiarity with the topics of a limited set of experimental passages. It is important to note, however, that such a measure is quantitative in nature. For example, the method of paired comparisons does not tell us the extent of the organization imposed upon the subject's prior knowledge. Moreover, the method of paired comparisons is subjective in nature; that is, high familiarity for one subject might be quite different from high familiarity for another subject. Langer's (1984) measure of topic familiarity, in contrast, enables one to differentiate between knowledge that is diffusely organized and associational, partially organized and concrete, or highly organized and abstract and it provides an external measure of the level of topic familiarity. Overall, though, we think that using paired comparisons to assess relative topic familiarity is worthy of more study. If paired comparisons holds up under further scrutiny, then we may wish to add it to our expanding repertoire of methods for assessing prior knowledge (Johnston, 1984; Langer, 1984).

The second procedural issue that may be of interest to other researchers is the use of multiple measures to assess sensitivity to importance. As we have stressed throughout this paper, sensitivity to importance is a complex ability that varies as a function of a number of variables including

task demands. Garner, Belcher, Winfield, & Smith (in press) argue that multiple measures of a complex ability (e.g., summarization) allow the researcher to better assess the range of performance across tasks. We agree and the results of this study lend more empirical support to their contention. For example, in this study, the children and the adults rated the importance of each sentence in each passage and wrote summaries of each passage. These two tasks, rating and summarizing, require the reader to manipulate the information in the passages in different ways. By using multiple measures we can better appreciate the effects that each of these tasks have on how readers make decisions regarding important information.

In this study we examined how two factors -- reading achievement and topic familiarity -- contribute to readers' sensitivity to important information in text. We will conclude by identifying one final question that future research should address more fully: How does the context of schooling affect the readers' ability to discern important and trivial information? Recent studies of reading and writing in a school context (Applebee, 1984; Durkin, 1978-79; Newell, 1984) indicate that students spend most of their time manipulating rather trivial aspects of content area information as opposed to the more generalizable concepts. Surely the bias of standardized test toward bits and pieces of information rather then organizing principles and

concepts must affect what students take from their reading. To investigate the extent of this influence studies of the context of schooling will be necessary if we are to understand an important factor in students' developing ability to discern important from trivial information when they read instructional texts.

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Table 1

Intercorrelations Among the Four Dependent Measures by Achievement Group and by Level of Topic Familiarity

	POOR READERS (n = 29)			
	1	2	3	4
(1) Adult Ratings		.36	.59**	.37*
(2) Peer Ratings	.66**		.15	-.05
(3) Adult Summaries	.09	.02		.37*
(4) Peer Summaries	-.02	-.01	.55**	

	GOOD READERS (n = 27)			
	1	2	3	4
(1) Adult Ratings		.75**	.41*	.24
(2) Peer Ratings	.86**		.46*	.09
(3) Adult Summaries	.17	.09		.63**
(4) Peer Summaries	.34	.32	.78**	

Note Coefficients above the diagonal are for Low Topic Familiarity.
Coefficients below the diagonal are for High Topic Familiarity.

* $p < .05$

** $p < .005$

Table 2

Summary of Multivariate Analyses of Variance

SOURCE OF VARIATION	MULTIVARIATE F	TESTS OF SIGNIFICANCE Univariate F			
		Adult Ratings	Peer Ratings	Adult Summaries	Peer Summaries
READING ACHIEVEMENT	3.72*	9.20**	2.73	5.68*	.03
TOPIC FAMILIARITY	2.69*	9.23**	7.68*	2.50	1.26
TOPIC X ACHIEVEMENT	1.07	1.62	3.59	.01	.69

Note There are 4, 51 df for each of the Multivariate F tests and 1, 54 df for each of the Univariate F tests.

* $p < .05$

** $p < .005$

Table 3

Mean Scores for Different Measures of Sensitivity to Importance by Achievement Group and by Level of Topic Familiarity

GROUP	Adult Ratings[a]		Peer Ratings[a]		Adult Summaries[b]		Peer Summaries[b]	
	LFT[c]	HTF[d]	LFT	HFT	LFT	HFT	LTF	HFT
Poor Readers	.12(.25)	.21(.29)	.21(.23)	.25(.30)	.25(.25)	.31(.28)	.39(.26)	.40(.27)
Good Readers	.22(.26)	.41(.29)	.22(.26)	.41(.24)	.35(.25)	.40(.26)	.35(.25)	.42(.26)
Adults	--	--	.50(.27)	.69(.24)	--	--	.45(.22)	.60(.26)

Note N of cases: Poor Readers = 29; Good Readers = 27; Adults = 37.

Numbers in Parentheses are Standard Deviations.

[a]Subjects' scores are Pearson Correlation Coefficients

[b]Subjects' scores are Point-biserial Correlation Coefficients

[c]Low Topic Familiarity

[d]High Topic Familiarity